Prevalence and Management of Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD) through Cognitive Behavioral Therapy (CBT) among Adolescent Girls

Synopsis

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Submitted by

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1. Conceptualization of Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD)

Adolescent girls are dynamic individuals who embody strength, resilience, and potential as they navigate a critical phase of development. They fulfill various roles within their families, schools, and communities, each contributing to their evolving identity. During adolescence, girls face unique challenges as they balance personal growth with societal expectations, especially in terms of reproductive health. As adolescent girls' transit into another stage of life span, they begin to understand and manage the complexities of their reproductive systems, which play a crucial role in their overall well-being. Adolescent girls have the innate ability to inspire change, advocate for their health, and build strong connections, all while nurturing their development and preparing for future roles in society. Their reproductive health is essential not only for their individual growth but also for the health of future generations.

1.1 Reproductive Health of Adolescent Girls

Reproductive health is vital to the overall well-being of adolescent girls and plays a significant role in their development, with implications for their future health and the well-being of future generations. Adolescent girls require more focused attention regarding reproductive health due to the complex functional responsibilities of the female reproductive system. These are responsible for fertilization and development of oocytes, creating a conducive environment for fertilization, and preparing the body for potential pregnancy. The critical functions of the female reproductive system have a profound impact on a girl's life, making the holistic health of their reproductive system essential not only for their individual well-being but also for the broader society.

The female reproductive system is composed of multiple organs with intricate functions, making it susceptible to various health challenges during adolescence. Among these challenges, Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD) are common concerns associated with the menstrual cycle. PMS involves a combination of physical and emotional symptoms that occur before menstruation. As defined by a **National Institute of Mental Health (NIMH, 2022)** PMS is "a constellation of mood, behavioral, and/or physical symptoms that have a regular cyclical relationship to the luteal phase of the menstrual cycle, are present in most if not all cycles, and remit by the end of

the menstrual flow with a symptom-free interval of at least one week each cycle." **Dutta (2009)** describes PMS as a "psycho-neuroendocrine disorder of unknown etiology, often noticed just prior to menstruation."

PMDD, a more severe form of PMS, typically occurs in the final phase of the menstrual cycle and can significantly impact adolescent girls. Those with PMDD may experience severe psychological symptoms such as depression, irritability, anger, and tension before the onset of menstruation each month. PMS and PMDD directly and indirectly affect the health and quality of life of adolescent girls, influencing their physical, emotional, and social development during these critical years.

1.2 The Prevalence of PMS and PMDD

PMS affects approximately 30-40% of females those experience monthly distress due to its symptoms **(Yonkers et al., 2008)**. Symptoms can range from mild to severe, often prompting females to seek lifestyle modifications due to significant discomfort. The impact of PMS on daily life can be profound, leading to absenteeism from work or school, decreased productivity, and strained relationships. Common physical symptoms of PMS include bloating, breast tenderness, headaches, fatigue, and changes in appetite. Emotional and behavioral symptoms may involve irritability, mood swings, anxiety, and depression. These symptoms typically begin in the luteal phase of the menstrual cycle and resolve with the onset of menstruation **(Yonkers et al., 2008).**

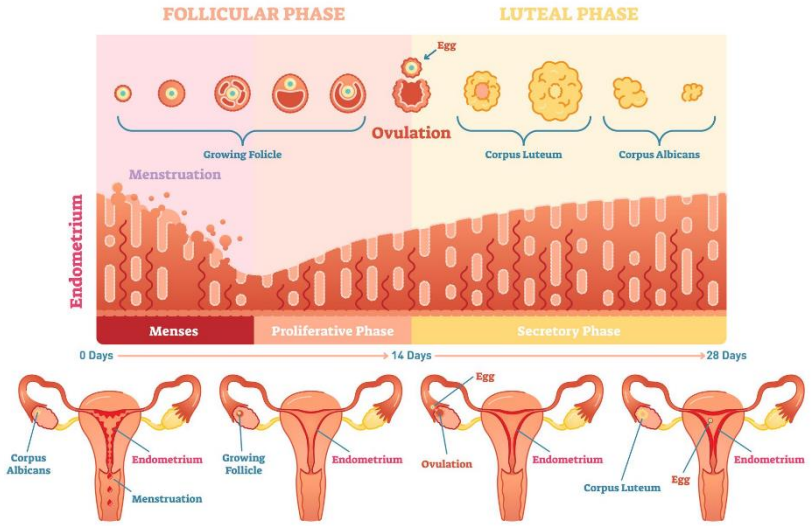

Figure 1: Phases of menstrual cycle
(Source: Brown, (2022))

PMDD, though less common, is more debilitating, affecting about 3-8% of females of reproductive

age **(Pearlstein & Steiner, 2008)**. The severity of PMDD symptoms can cause significant impairment in social, occupational, and other areas of functioning. Females with PMDD often experience extreme mood swings, depression, and irritability, leading to serious interpersonal conflicts and a diminished quality of life. (**According to the DSM-5**), PMDD symptoms include at least one of the following: marked mood swings, irritability or anger, depressed mood, or anxiety. Additional symptoms may include decreased interest in usual activities, difficulty concentrating, lethargy, changes in appetite, sleep disturbances, and feelings of being overwhelmed (**American Psychiatric Association, 2013**).

1.3 The Impact of PMS and PMDD on Adolescent Girls' Health and Well-Being

PMS and PMDD affect the health and well-being of adolescent girls. Research shows that these conditions can lower quality of life, with PMDD having a more intense impact due to its severe emotional and psychological symptoms **(Freeman et al., 2011).** Adolescent girls with PMDD often struggle with personal and social relationships and may need more frequent healthcare visits for ongoing management and treatment. The main difference between PMS and PMDD is the severity and impact of the symptoms. While PMS can be upsetting, it usually doesn't disrupt daily activities as much as PMDD does. PMDD symptoms are so severe that they can significantly impair social, school, and family life **(Pearlstein & Steiner, 2008).**

1.4 Management of PMS and PMDD

PMS arises from hormonal events that occur after ovulation. Symptoms can start in the early, mid, or late luteal phase and are not associated with specific concentrations of any particular gonadal or non-gonadal hormone. Females with PMS experience affective or somatic symptoms that cause severe dysfunction in social or occupational domains. According to the **World Health Organization (1996),** these symptoms include psychological discomfort, bloating and weight gain, breast tenderness, swelling of the hands and feet, aches and pains, poor concentration, sleep disturbances, and changes in appetite. While females with mild-to-moderate PMS symptoms often do not require pharmacology treatment, PMDD often necessitates treatment due to its impact on social functioning. Types of treatment options for management of PMS and PMS are as follows.

1.4.1 Medical / Hormonal Treatment

PMS and PMDD frequently co-occurs with mood and anxiety disorders, complicating diagnosis and

treatment **(Kuehner et al., 2022).** Integrated approaches that address both PMS, PMDD and its comorbid conditions are recommended to enhance treatment outcomes. Advances in diagnostic tools, such as improved symptom tracking and standardized questionnaires, have increased the accuracy and reliability of PMS and PMDD diagnoses **(Hantsoo et al., 2020).**

Hormonal treatments, including oral contraceptives and Gonadotropin-Releasing Hormone Agonists **(**GnRH agonists), have also been effective in managing PMDD symptoms, although individual responses can vary, and side effects may occur **(Kornstein et al., 2018).** Long-term treatment with Selective Serotonin Reuptake Inhibitors (SSRIs) and hormonal therapies has demonstrated sustained benefits in managing PMDD symptoms, with continued efficacy observed over extended periods **(Lawson et al., 2022).**

1.4.2 Educational and Awareness Programs

Health education is a vital component of reducing symptoms of Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD) through educational and awareness programs. These programs aim to increase awareness about the nature, symptoms, and management strategies for PMS and PMDD among women and healthcare providers. By educating women about the physiological and psychological aspects of these conditions, such programs empower them to recognize symptoms early, seek appropriate care, and adopt effective self-management techniques, such as lifestyle modifications and stress management **(Delara, 2016).**

1.4.3 Treatment Based on Modification in Cognition, Lifestyle and Behavior

Lifestyle and behavioral strategies are key in managing Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD). Regular physical activity, such as aerobic exercise, helps alleviate symptoms by reducing stress and improving mood. A balanced diet rich in complex carbohydrates, fiber, and lean proteins, while limiting salt, caffeine, and sugar intake, can stabilize blood sugar levels and reduce bloating and mood swings. Adequate sleep and stress management techniques like yoga, meditation, or deep-breathing exercises are also essential for managing symptoms of PMS and PMDD **(Pearlstein & Steiner, 2008; Gropper et al., 2018; Bhatia et al., 2019).**

Cognitive Behavioral Therapy (CBT) is a structured, time-limited, and goal-oriented approach aimed

at modifying negative thought patterns and behaviors to enhance emotional regulation and mental well-being. Based on the premise that thoughts, feelings, and behaviors are interconnected, CBT helps individuals alter maladaptive thoughts, leading to improvements in emotions and behavior **(Beck, 2011)**. It has proven effective for conditions like anxiety, depression, and stress-related disorders **(Hofmann et al., 2012)**. In the context of PMS and PMDD, CBT helps individuals recognize symptom triggers, develop coping strategies, challenge irrational thoughts, and practice relaxation techniques. It also promotes healthy lifestyle changes, such as regular exercise and balanced eating, which can reduce mood swings, anxiety, irritability, and physical symptoms **(Hunter & Ussher, 1997; Busse et al., 2009)**. Additionally, CBT enhances emotional regulation through mindfulness and stress management, increasing self-efficacy and providing long-lasting benefits **(Blake et al., 1998; Hofmann, 2018).**

Nonpharmacological therapies, such as lifestyle modifications and CBT are suitable treatments for PMS and PMDD **(Jarvis et al., 2008; Landolt & Ivanov, 2020).** Research shows that CBT and similar psychotherapeutic approaches significantly reduce symptoms of PMS and PMDD. A study showing notable improvements among females who engaged in aerobic exercise **(Samadi et al., 2013).** While Selective Serotonin Reuptake Inhibitors (SSRIs) like fluoxetine and sertraline are effective for PMDD but CBT remains a promising nonpharmacological intervention for improving mood and psychological well-being **(Yonkers et al., 2016; Epperson et al., 2016; Dennerstein et al., 2017).**

1.4.4 Alternative and Complementary Therapies

Acupuncture and **herbal medicine** are two alternative and complementary therapies often used to manage symptoms of Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD).

Acupuncture involves the insertion of thin needles into specific points on the body to balance the flow of energy. It is believed to help reduce symptoms such as mood swings, irritability, and pain by promoting the release of endorphins and improving blood circulation. A study suggests that acupuncture may alleviate both physical and emotional symptoms associated with PMS and PMDD by regulating hormonal imbalances and reducing stress **(Habek et al., 2013).**

Herbal medicine uses plant-based remedies to address various symptoms. Common herbs like

chasteberry, evening primrose oil, and St. John's wort are often recommended for their potential to balance hormones and improve mood. Chasteberry, for instance, has been shown to reduce breast tenderness, irritability, and mood swings by influencing prolactin levels **(Nast et al., 2005).**

2. Rationale of the study

The proposed study entitled "Prevalence and Management of Premenstrual syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD) through Cognitive Behavioral Therapy (CBT) among Adolescent Girls" is exclusively required to validate the effect of CBT in Indian context as researcher has not come across any CBT intervention-based research for reducing the symptoms of PMS and PMDD in India. Although prevalence-based studies were found in many states of India which shows a high prevalence of moderate to severe PMS among college going adolescent girls (**Bhuvaneswari et al., 2019). Sharma, A. (2023)** conducted a study in rural Uttar Pradesh which revealed that cultural beliefs, such as attributing PMS symptoms to spiritual causes, often prevent females from seeking medical and psychological help, emphasizing the need for localized studies. Research studies from Haryana and Madhya Pradesh further underscores the importance of this study. In Haryana, high prevalence rates of PMS and PMDD have been reported, with cultural stigmas and a lack of awareness contributing to underdiagnosis and undertreatment of PMS and PMDD **(Singh et al., 2017)**. Similarly, studies in Madhya Pradesh indicate that females face significant challenges in managing PMS due to limited healthcare access and a lack of culturally sensitive medical practices **(Sharma & Patidar., 2018).**

According to Gupta et al (2020) PMS is highly prevalent among urban females and significantly affecting their daily functioning and productivity. This study highlighted gaps in awareness and proper management of PMS and PMDD, even in urban settings with better healthcare access compared to rural areas. According to **Sharma and Singh (2021)** found that cultural beliefs and social stigma contribute to underreporting and inadequate management of PMS. Research by **Durairaj and Ramamurthi (2019)** in Tamil Nadu identified significant impacts of PMS and PMDD on daily functioning and mental health, **Mishra et al (2015)** also found lack of awareness and improper diagnosis as significant barriers to effective treatment for PMDD among medical students.

3. Justification of the study

The proposed study, entitled "Prevalence and Management of Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD) through Cognitive Behavioral Therapy (CBT) among Adolescent Girls," aims to alleviate the symptoms of PMS and PMDD that significantly impair the quality of life for affected individuals. PMS impacts up to 80% of females, while PMDD affects 3-8% **(Pearlstein & Steiner, 2008).** Despite the high prevalence of PMS, it remains widely misunderstood and inadequately treated. Conventional treatments, such as hormonal and pharmacological options, often fall short of addressing the full range of symptoms and may lead to undesirable side effects, underscoring the need for a more integrative approach. By understanding complex nature of this disorder—which encompass hormonal, psychological, and lifestyle factors—comprehensive understanding is essential for developing effective management strategies.

Current researches are limited by significant gaps, including the lack of standardized protocols and personalized treatment options, contributing to substantial social and economic costs. The proposed study seeks to provide data on the prevalence and impact of PMS and PMDD on adolescent girls. Cognitive Behavioral Therapy (CBT) is recognized as a critical intervention for managing PMS and PMDD, it offers a non-pharmacological approach that addresses the psychological and emotional components of PMS and PMDD, which are often overlooked in conventional treatment protocols. Since hormonal and pharmacological treatments may not fully address the range of symptoms and can cause undesirable side effects, CBT provides an integrative and effective alternative. The proposed research will help adolescent girls to manage the cognitive and behavioral aspects of PMS and PMDD through CBT which will enable them to identify and modify negative thought patterns and behaviors that exacerbate symptoms. The proposed study aims to fill a critical gap by evaluating the efficacy of CBT reducing the symptoms of PMS and PMDD among adolescent girls, providing essential evidence for developing behavior appropriate interventions. Sample of Adolescent girls are particularly vulnerable to the negative impacts of PMS and PMDD therefore research will be an attempt to improving quality of life by reducing PMS symptoms through CBT.

4. Statement of the problem

"Prevalence and Management of Premenstrual Syndrome (PMS) and Premenstrual Dysphoric

Disorder (PMDD) through Cognitive Behavioral Therapy (CBT) among Adolescent Girls"

5. Operational Definitions

5.1 Premenstrual Syndrome (PMS) refers to a group of physical, emotional, and behavioral symptoms that occur in a cyclical pattern, typically in the luteal phase of the menstrual cycle (after ovulation and before the onset of menstruation). These symptoms can vary widely in severity and may include mood swings, tender breasts, food cravings, fatigue, irritability, and depression. PMS affects many individuals of reproductive age and can interfere with daily activities and quality of life. **National Health Service (NHS., 2022).**

5.2 Premenstrual Dysphoric Disorder (PMDD) is a severe, sometimes disabling extension of premenstrual syndrome (PMS). It is characterized by significant mood disturbances, such as depression, irritability, and tension, along with physical symptoms like bloating and breast tenderness. These symptoms occur in the luteal phase of the menstrual cycle and are severe enough to interfere with work, social activities, and relationships. **(American Psychiatric Association, 2013)**

5.3 Adolescence is the period of life between the ages of 10 to 19 years. This definition emphasizes the transitional phase between childhood and adulthood, characterized by rapid physical, cognitive, emotional, and social development. **World Health Organization (WHO, 1986).** For the proposed research term adolescence will be referred to adolescent girls aging between 15 to 18 years.

5.4 Prevalence is the proportion of a population found to have a particular condition or disease at a specific time. It is expressed as a percentage or ratio and helps to understand how widespread a condition is within a population. Prevalence can be measured at a single point in time. (**Smith et al., 2021).**

5.5 Cognitive Behavioral Therapy (CBT) is a psychotherapeutic approach that focuses on identifying and modifying negative thought patterns and behaviors to improve emotional regulation and mental well-being. CBT is based on the concept that thoughts, feelings, and behaviors are interconnected, and by changing maladaptive thoughts, individuals can achieve

positive changes in their emotions and behaviors **(Beck, 2011)**.

6. Objectives of the study

- To assess socio – demographic profile of the sample.
- To assess the level of awareness about nature, misconceptions and management strategies for PMS & PMDD.
- To identify the prevalence and severity of PMS and PMDD among adolescent girls.
- To plan and implement CBT for reducing the symptoms of PMS among intervention group.
- To study the changes in symptoms of PMS after intervention.
- To evaluate the suitability and sustainability of intervention.
- To disseminate information among masses.

7. Research Methodology

7.1 Study Design

Mixed Method Design will be used to conduct proposed research in which data will be collected both quantitatively and qualitatively to provide a comprehensive understanding of Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD) among adolescent girls.

- **Exploratory Research:** To assess prevalence, awareness and misconception about PMS and PMDD among adolescent girls.
- **Descriptive Research:** To document the severity, and impact of various background factors on severity of PMS/PMDD among the adolescent girls.
- **Action Research:** To implement and evaluate an intervention aimed at improving awareness and management of PMS among selected adolescent girls.

7.2 Sample Design

7.2.1 Locale of the study: - Agra city will be conveniently selected as the locale of the proposed study.

7.2.2 Sampling Technique

Participants of the study will be selected using a ***multistage stratified random sampling*** technique to ensure representation of adolescent girls of Agra City.

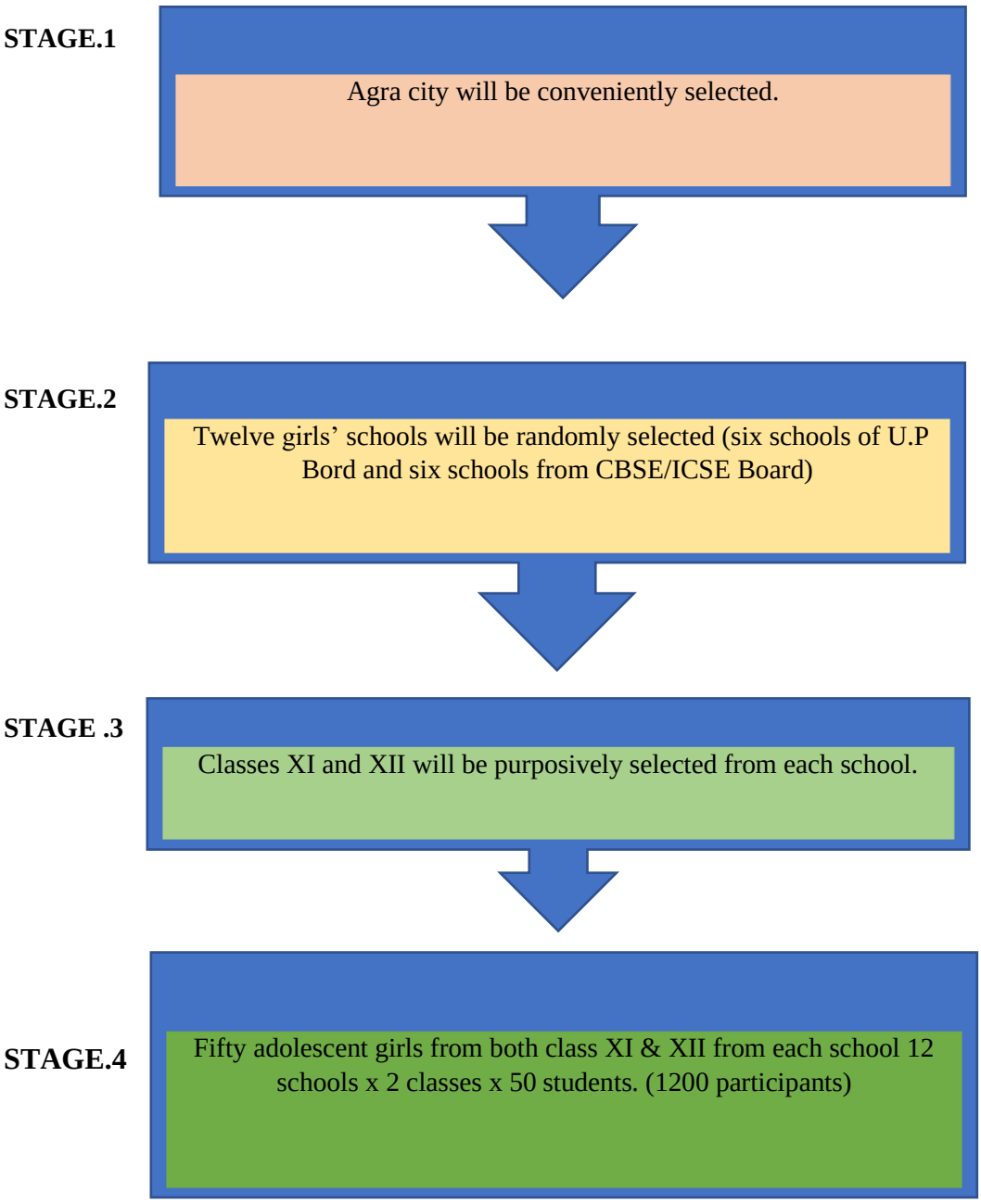
STAGE.1
Agra city will be conveniently selected.
STAGE.2
Twelve girls' schools will be randomly selected (six schools of U.P Bord and six schools from CBSE/ICSE Board)
STAGE .3
Classes XI and XII will be purposively selected from each school.
STAGE.4
Fifty adolescent girls from both class XI & XII from each school 12 schools x 2 classes x 50 students. (1200 participants)

Figure 2: Stages for Sample selection of Adolescent Girls

7.2.3 Selection of Subject

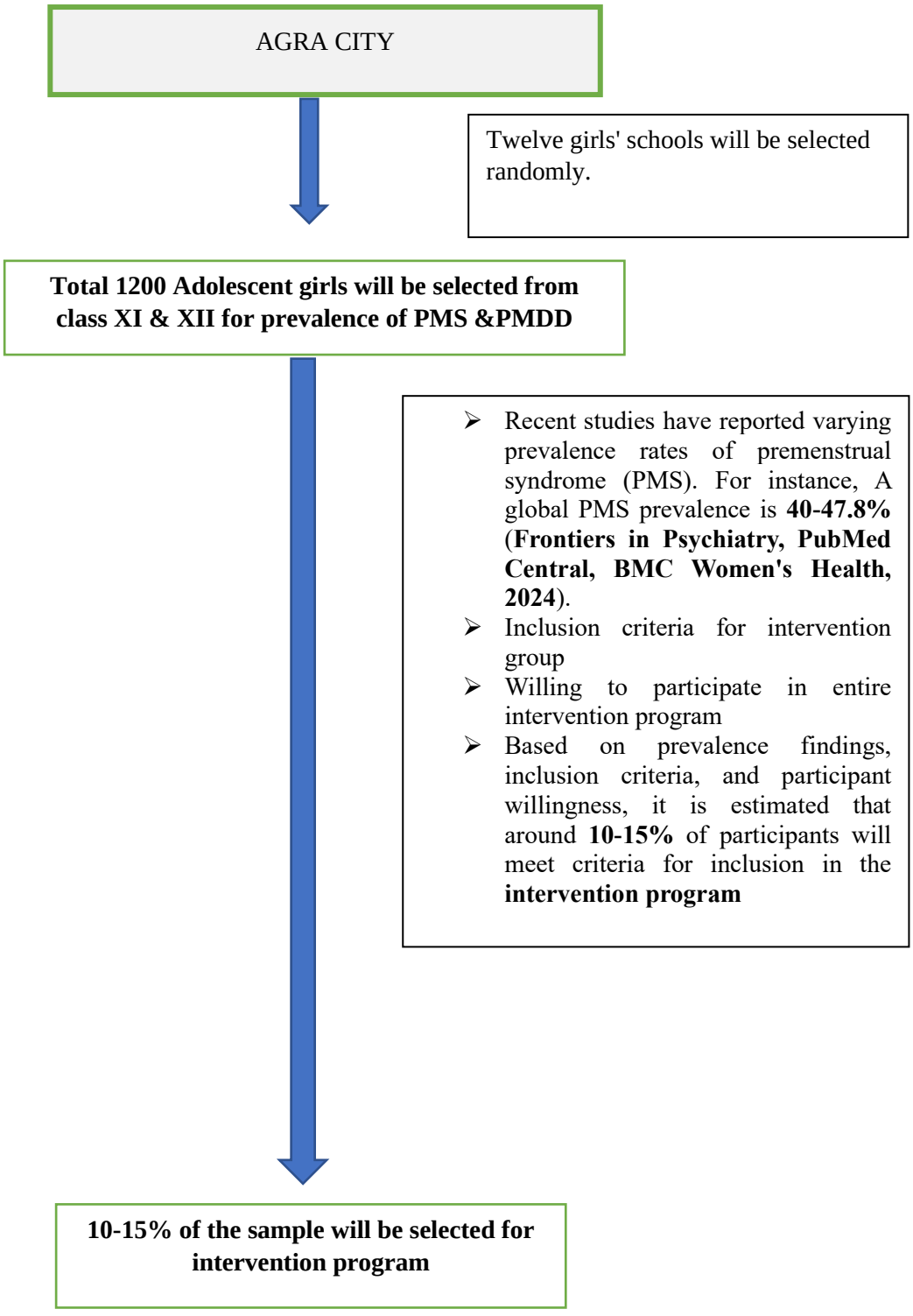
AGRA CITY
Twelve girls' schools will be selected randomly.
Total 1200 Adolescent girls will be selected from class XI & XII for prevalence of PMS &PMDD
Recent studies have reported varying prevalence rates of premenstrual syndrome (PMS). For instance, A global PMS prevalence is 40-47.8% (Frontiers in Psychiatry, PubMed Central, BMC Women's Health, 2024).
Inclusion criteria for intervention group
Willing to participate in entire intervention program
Based on prevalence findings, inclusion criteria, and participant willingness, it is estimated that around 10-15% of participants will meet criteria for inclusion in the intervention program
10-15% of the sample will be selected for intervention program

Figure 3: Sample selection for Intervention Group

The proposed study will be conducted on a total sample of 1200 adolescent aging between 15 to 18 years, fifty students from each Classes XI and XII will be randomly selected from each girls' school affiliated with CBSC/ICSE and U.P Board. Girls with PMS and PMDD will be identified based on

their symptoms, and intervention will be carried out only on girls affected by PMS and fulfilling the selection criteria.

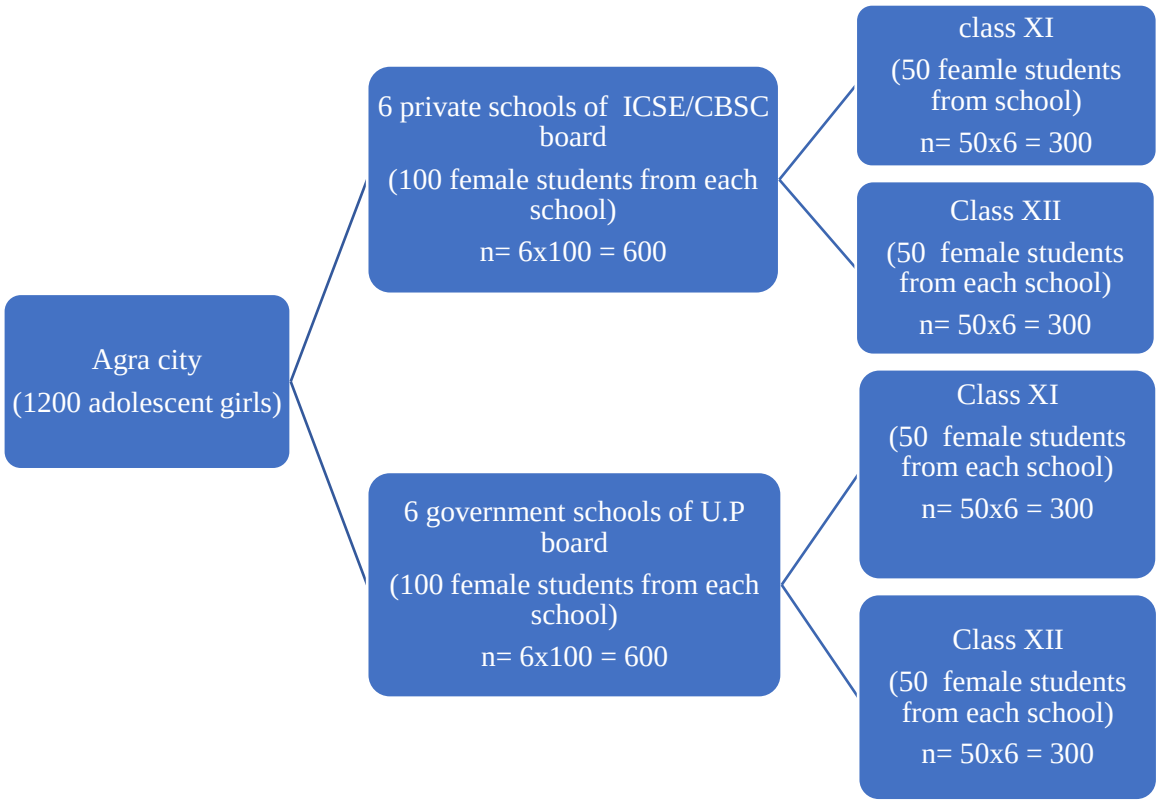
Agra city
(1200 adolescent girls)
6 private schools of ICSE/CBSC board
(100 female students from each school)
n= 6x100 = 600
6 government schools of U.P board
(100 female students from each school)
n= 6x100 = 600
class XI
(50 feamle students from school)
n= 50x6 = 300
Class XII
(50 female students from each school)
n= 50x6 = 300
Class XI
(50 female students from each school)
n= 50x6 = 300
Class XII
(50 female students from each school)
n= 50x6 = 300

Figure 4: Distribution of Sample and Sample Size

(n= number of sample size)

7.2.4 Criteria of sample selection

7.2.4.1 Inclusion criteria

- Recent studies have reported varying prevalence rates of premenstrual syndrome (PMS). For instance, A global PMS prevalence is 40-47.8% **(Frontiers in Psychiatry, *PubMed Central*, *BMC Women's Health*, 2024)**. Based on these findings, it is assumed that approximately 10-15% of participants will meet the specified inclusion criteria for the intervention sample size.
- Intervention will be conducted only on adolescent girls aging between 15-18 years.
- Only those adolescent girls will be included as sample who have regular menstrual cycle for last 6 months.
- Intervention will be conducted only on those girls who will have mild to moderate symptoms of PMS.

- Intervention will be conducted only on those adolescent girls who are willing to participate in the intervention program.
- Only those adolescent girls will be included as final sample who will take part in whole intervention process.

7.2.4.2 Exclusion criteria

- Individuals with a history of psychiatric disorders unrelated to PMS or PMDD that could confound study results (e.g., major depressive disorder, generalized anxiety disorder).
- Girls having irregular menstrual periods during the last 6 months.
- Adolescent girls who will decline to participate.
- Girls currently using hormonal contraceptives, hormone replacement therapy, or other medications that could interfere with the menstrual cycle or mask symptoms of PMS or PMDD.
- Participants with chronic medical conditions (e.g., thyroid disorders, diabetes) that could influence hormonal balance or menstrual cycle regularity.
- Adolescent girls will experience mild symptoms of PMS.

7.3 Variables of research

- **Independent Variables: -** Age, Socio-Economic status, Body Mass Index (BMI), Physical activity and Family medical history related to PMS.
- **Dependent variables: -** PMS, PMDD.

7.4 Phases of Research

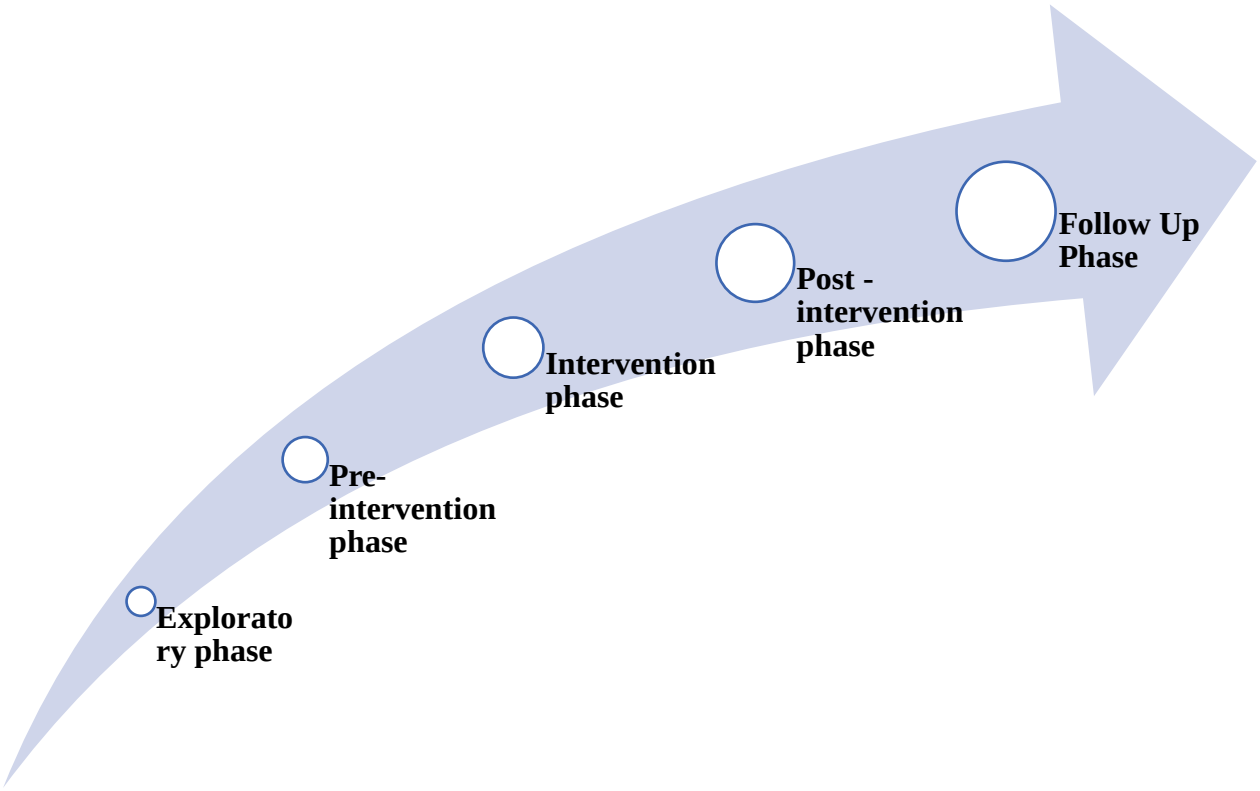

Figure 5: Phases of Research

7.4.1 Phase 1: Exploratory Phase

- **Selection of Girls Participants through girls' schools**: A multistage stratified random sampling method will be employed to select 1,200 adolescent girls from randomly selected girls' schools affiliated with the ICSE, CBSE, and U.P. boards.
- **Consent to participants in study**: Obtain necessary informed consent of participants and their parents.
- **Baseline Data Collection**: Gather detailed demographic, clinical, and lifestyle information through questionnaires.
- **Assessment of prevalence and severity of PMS and PMDD**: The diagnosis of PMS and PMDD will be conducted with the assistance of a gynecologist and appropriate research tools.
- **Extraction of Intervention Group**: Adolescent girls experiencing mild to moderate symptoms of PMS and fulfilling the criteria for sample selection will be identified, extracted and selected for

the intervention group.

7.4.2 Phase 2: Pre-Intervention Phase

- The researcher will consult a gynecologist during pre-intervention phase to design better CBT based strategy model for adolescent girls suffering from PMS.
- The researcher will take help of psychologist for individualized counselling for CBT during pre-intervention and intervention phase.
- A gynecologist will also be involved in cases which require special focus or attention to plan and implement individualized intervention for adolescent girls.
- Develop CBT plan and behavioral strategies based on lifestyle changes.
- Design informative resources, such as pamphlets, leaflets, and audio-visual aids, to enhance awareness of PMS.

7.4.3 Phase 3: Intervention Phase

- Implement a nine -months (6 months extensive CBT training + 3 months monitored training) CBT based intervention among participants under the intervention.
- The researcher will contact to targeted participants under intervention once a week during the whole intervention phase.
- After 6 months of exhaustive CBT training, in next 3 months researcher will regularly remind and motivate participants under intervention to practice CBT in their daily routine.
- Reminders will be sent electronically to participants under intervention during 3 months monitoring period prompting them to complete the checklist of symptoms to monitor the symptoms of PMS during the luteal phase of each menstrual cycle.
- Mid evaluation of symptoms of PMS to make any necessary and required adjustments in individualized CBT intervention.

Table 1 Components of the CBT-based treatment for the intervention group

Cognitive Strategies	**Behavioural Changes in Lifestyle**
Part 1: Psychoeducation about PMS and its causes	
Cognitive Part 2: Psychoeducation about the role of thoughts and its relationship with emotions and behaviour (cognitive triad)	**Behavioural Part 2:** Psychoeducation about the interaction between stress and PMS, and learning relaxation techniques
Cognitive Part 3: Transition to a specific view of PMS	**Behavioural Part 3:** Psychoeducation about the interdependence between nutrition, exercise, and PMS

Cognitive Part 4: Reconstruction of dysfunctional cognitions	**Behavioural Part 4:** Integrating exercise into daily life through motivational programs and strategies
Cognitive Part 5: Psychoeducation about specific PMS misconceptions and the application of learned cognitive strategies	**Behavioural Part 5:** Balanced diet and its implementation in daily life
Cognitive Part 6: Psychoeducation about useful thoughts and the development of a new evaluation	**Behavioural Part 6:** Psychoeducation about the impact of stress-related mistakes on judgment
Cognitive Part 7: Specific PMS behaviours (benefiting from healthcare, protection, and communication)	**Behavioural Part 7:** Education and implementation of positive activities in daily life
Part 8: Summary of training and relapse prevention	

(Source: Adapted from **Borji-Navan et al., (2022).** "Internet-based cognitive-behavioral therapy for premenstrual syndrome: a randomized controlled trial")

7.4.4 Phase 4: Post-Intervention Phase

- **Post-Intervention Assessment**: Collecting post assessment data during post intervention period. This includes collection of data by re-administering the symptom severity scales.
- **Qualitative Feedback**: Gather qualitative feedback from participants regarding their experiences with the intervention and identify areas for improvement.
- **Data Analysis**: Analyze the collected data to determine the impact of the intervention on PMS symptoms. Compare pre- and post-intervention data to assess changes in symptom severity and overall well-being.
- **Reporting and Dissemination**: Compile the findings into a comprehensive report, sharing results with stakeholders, including participants, healthcare providers, and community leaders. Publish results in academic journals and present at conferences to contribute to the broader understanding of PMS and PMDD.

7.4.5. Follow-Up Phase

Data collection for assessing the sustainability of CBT based intervention among selected adolescent girls and observing the changes in symptoms of PMS continuously for three months after completion of six months intervention phase.

7.5 Research Tools

To ensure consistency and reliability in this proposed study, standardized tools will be adopted that have been rigorously validated in previous research. The use of these tools will allow accurate data collection and comparison across different study populations, enhancing the credibility of research

findings.

Table 2 Brief description of research tools

Tools	Name	Author's Name And year	Objective	Key Domains of the tool
1	Socio-demographic	Self – constructed	To assess primary information	Age, Socio- economic status, BMI and family medical history related to PMS and PMDD.
2	PMS Impact Questionnaire	Johanna, 2016 (Adapted)	To gather demographic information and assess the impact of PMS.	• Psychological Impact • Functional Impact
3	DSM-5 PMDD/PMS Criteria Questionnaire	The DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, 5th Edition) is published by the American Psychiatric Association (APA) 2013 (Adapted)	To diagnose PMS/PMDD based on standardized criteria.	• Mood Symptoms • Physical and Behavioural Symptoms
4	CBT	Self-constructed	For intervention	Cognitive and behavioural components
5	A-V Aids / Discussion session	Self – constructed	To spread awareness and dissemination of information regarding PMS and PMDD.	Leaflets and pamphlets
6	Feedback tool	Self – constructed	To assess success of intervention	_____

7.6 Statistical Design

The collected information will be analyzed and interpreted with the help of following statistical tool and tables, respectively.

- Frequency
- Percentage
- Arithmetic Mean
- Standard deviation
- Correlation
- t – test

8. Delimitations of the study

- The proposed study will be conducted only in Agra city.
- Only girls' schools will be targeted for sample selection for the proposed study.
- The proposed study will be conducted only on 1200 adolescent girls.
- The study will only be conducted in 12 randomly selected schools of Agra city affiliated with ICSE/CBSE and U.P bord.
- CBT based plan and strategies will be used to reduce the symptoms of PMS.
- Intervention will be conducted only on those adolescent girls who will fulfill the criteria of sample selection.

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